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ABSTRACT

Twelve colleges participated in a cost quality study. These colleges were: Allegheny College, Bryn Mawr College, Buchnell University, Carnegie-Mellon University, Chatham College, Dickinson College, Franklin and Marshall College, Gettysburg College, Haverford College, Lafayette College, Lehigh University, and Swarthmore College. The study is an immediate guide to the twelve institutions for their analysis of resource allocation. The report covers faculty, academic programs, library, administration and student services, student aid, and cash management. Other areas, such as auxiliary enterprises, were explored. (MJM)

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THE TWELVE COLLEGE COST-QUALITY STUDY

JANUARY 1972

HE 006 021

McKinsey & Company, Inc.

THE TWELVE COLLEGE

COST-QUALITY STUDY

Participating Institutions	President
Allegheny College	Lawrence L. Pelletier
Bryn Mawr College	Harris L. Wofford
Bucknell University	Charles H. Watts II
Carnegie-Mellon University	H. Guyford Stever
Chatham College	Edward D. Eddy
Dickinson College	Howard L. Rubendall
Franklin and Marshall College	Keith Spalding
Gettysburg College	C. Arnold Hanson
Haverford College	John R. Coleman
Lafayette College	K. Roald Bergethon
Lehigh University	W. Deming Lewis
Swarthmore College	Robert D. Cross

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THE TWELVE COLLEGE COST-QUALITY STUDY

INTRODUCTION AND COMMENTARY

Historically the private colleges and universities of the United States have demonstrated a surprising resiliency. Their demise has been predicted periodically since the earliest days when the Puritan fathers discovered to their dismay that men of academe could love both religion and the spirit of liberty. The nation's educational history is marked by frequent attempts to crush or to starve the zest for learning which has been particularly characteristic of independent higher education in America. To borrow from the Bard, "The course of true learning never did run smooth."

As a group of twelve long-standing and also free-standing colleges and universities, we do not view either the present or the future with the depth of pessimism in which "the prognosis for our survival" is often couched. We are not about to expire. On the other hand, we know that the conditions which sustain genuine quality can deteriorate rather rapidly. We do not wish to teach and to promote learning in a time when mediocrity is acceptable because nothing else can be afforded.

Our early and individual attempts to relate cost to quality and to find areas ripe for cost reduction resulted, for the most part, in tampering with trivia. The absence of reliable data on true costs in higher education and the absence particularly of sound comparative data became apparent and crippling. Without such information it isn't easy to cut expenditures in institutional budgets which are the result of decades of experience and tradition. As a result, many colleges and universities have hoped that somehow a combination of government aid, both Federal and state, would bail us out. But the process of obtaining consensus within government circles regarding the form of that aid plus the reluctance of some to recognize its necessity causes many of us to wonder if it will ever come and, if it should come, whether it would ever be sufficient.

The Cost-Quality Study is an effort on the part of twelve leading institutions of higher learning to work together on a sensible solution to fiscal dilemmas. Income from government and private sources is essential but not sufficient. A key component is institutional self-analysis. The question becomes: How and where does a college or university pull back, reduce, eliminate or curtail without destroying its own academic purpose and integrity? Attention must be focused

on why the institution exists and what it intends primarily to accomplish. This report represents the first chapter of a comparative study of the sensible allocation of resources.

The twelve institutions which grouped together to undertake the study have not cooperated in joint efforts in the past. They are all "high expectation" institutions. Comparatively, their endowments are generous, their faculty and staff salaries are well above average, and their expenditures for equipment and libraries are beyond any hint of deprivation. Indeed, even their tuition charges are above average. As a group, they are "national" in the sense that they draw their students from many states and return their alumni to the service of more than the local area.

Curiously, in many ways institutions of this character have more to lose if a diminution of quality were to be imposed by outside economic circumstances. If independent higher education in the United States is to lose its strength, these are the truly vulnerable institutions.

Knowing only too well the implications in all that we have recited here, these twelve colleges and universities did not hesitate in accepting quickly and cooperating fully in a Cost-Quality Study. This has been a demanding survey in terms of a major commitment of staff time. It has also been a study which has proved graphically that institutions which are normally somewhat competitive and marked by some privatism in their approach can drop all such pretensions and share confidential information with one another without hesitation.

The joint approach was undertaken because it permitted comparative analyses of the utilization of resources by relatively similar institutions. Practical solutions could be assessed by sharing experiences. And some logical paths of action could be charted if a group agreed to the approach. Single institutions still find it difficult to experiment because of the genuine fiscal risks in failure.

Happily the Buhl Foundation sensed the possibilities in such a joint study and in the contribution which a cost-quality search might make to all higher education, both public and private. The twelve institutions were fortunate also in enlisting the advice and counsel of Dr. Samuel B. Gould, former Chancellor of the State University of New York and a man of experience in both private and public education. McKinsey & Company, Inc. gathered the data, carried out the analyses and formulated the recommendations which comprised the bulk of the study.

Early last summer the chief academic and business officers of the twelve colleges and universities met to identify those areas of operation offering the

greatest possibilities for substantial savings. Later the presidents added their perspective to the mounting conviction that mere budget juggling would not be enough. At a workshop held in November to survey the possibilities, the presidents, chief academic officers, and chief fiscal officers were joined by three more analysts and observers: Dr. Earl F. Cheit, Professor of Business Administration at the University of California and author of the Carnegie Commission report on the "New Depression in Higher Education"; Dr. Merrimon Cuninggim, President of the Danforth Foundation; and Dr. Frederic K. Miller, Commissioner for Higher Education in the Commonwealth of Pennsylvania who is now President of the Pennsylvania Commission for Independent Colleges and Universities.

We now know more about ourselves than we had expected. We have learned that many of the decisions regarding sensible allocation of resources go back to the basic purposes of the institution. For example, does one provide a library which houses as many published volumes as possible? Or does a college or university provide a library which serves the particular and sometimes peculiar needs of undergraduate education? Does a college make available substantial sums in the form of financial assistance to an ever-increasing number of economically disadvantaged students because it wants to do so, because it feels it must, or because it has slipped almost unthinkingly into a pattern from which escape is not easy? What sacrifices must be made if the pattern continues? What are the priorities?

We learned also that a surprising amount of disparity exists even within an apparently similar group of colleges and universities. Costs can vary widely without immediately obvious variations in results. Large differences occur in the cost of instruction per student within individual colleges and within particular disciplines offered by all in the group of twelve. We confirmed what we had suspected - that an academic program or service is not necessarily "good" merely because it requires a large expenditure of resources, nor is it necessarily "poor" in quality because it costs comparatively less. And we learned that it is not always simple but it is nonetheless rewarding to attempt to make comparisons between large and small colleges and universities.

The study is an immediate guide to the twelve institutions for their own analyses of resource allocation. The report presented here by McKinsey & Company covers faculty, academic programs, library, administration and student services, student aid, and cash management. Other areas, such as auxiliary enterprises, were explored until it became evident that further study would not be sufficiently productive or that the area was not of "high leverage" value. This report, which is designed in part as a guide to similar groups of institutions, limits the treatment of data to averages and over-all ranges in

order to preserve the confidentiality of each institutions figures. The twelve have available for internal use more detailed information and analyses. The present report does, however, give a sense of the scope of the study.

Each of the twelve colleges and universities will now look at itself in greater detail and with great care. Most of them have established or are establishing a committee or council on institutional priorities which will involve faculty members, trustees and students in decisions based on the information gathered in the study.

The twelve colleges and universities have decided to continue their association as an informal group in order to undertake further sharing of information and further studies, as well as to examine the possibility of some experimental approaches. Four areas appear ripe for immediate attention:

1. Faculty appointment and development. This study will be concerned with the relationship of individual human beings to institutional requirements and resources. What are the existing appointment policies and practices? How is the faculty member evaluated, continued under contract, moved toward tenure? What are the institutional pressures? What is the precise fiscal effect? Are changes possible and wise? What modifications might be made? (This study will be conducted in 1972 under grants from the Rockefeller Foundation and the United States Steel Foundation.)

2. A better system of evaluation accounting. Colleges and universities are not yet ready to study easily and thoroughly how costs relate to quality or to productivity. The present system is based on cash flow, rather than a ready look at resource allocation.

3. Detailed analysis of cost, efficiency and purpose in both administrative structure and in student services.

4. Further definition of the potential for cost saving in cash management.

This effort is but a beginning. It arises not out of desperation but from a genuine concern over the long-term quality of a remarkable agency in American life: the private colleges and universities which have provided higher education with some of its very best leadership.

Edward D. Eddy, Chairman

Chatham College
Pittsburgh, Pennsylvania

January 3, 1972

McKinsey & Company, Inc.

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1700 Pennsylvania Avenue, N.W.
Washington, D.C. 20006
202 223-9120

January 3, 1972

Dr. Edward D Eddy, Jr., President
Chatham College
Woodland Road
Pittsburgh, Pennsylvania 15232

Dear Sir:

With this letter we submit our final report on the Twelve College Cost-Quality Study. The report summarizes the large amount of data supplied by participating institutions, as well as the detailed analyses of these data. These data and analyses were discussed fully and distributed at the 2-day meeting held at Hershey, Pennsylvania. In this document we have limited our treatment of data to presenting averages and overall ranges of measured parameters so as to preserve the confidentiality of individual institutional data.

The report is oriented primarily toward two groups: (1) the participants in the Hershey meeting who, because it was impossible for any one person to attend all sessions, may have an incomplete picture of the whole study; and (2) the non-participant members of the 12 institutions, who may nevertheless be involved in the effort to realize potential opportunities identified during the study.

We have organized the discussion of the Study's background and findings into four sections:

A - Origins of the Study - discussing the nature of the financial difficulties confronting independent institutions of higher learning and the consequent establishment of the Cost-Quality Study.

B - Analytical Approach - describing the criteria by which the areas for examination were systematically determined and how comparative data were employed to suggest alternative uses of resources.

C - Opportunities for Improving Resource Utilization - suggested by the analysis of data indicating areas in which the institutions as a group appear to have opportunities to reduce real resources expended with a minimal impact on quality.

D - Concluding Observations - on the outcome and practical difficulties of such a study.

In addition, in an attachment, we have listed a series of questions to guide each institution as it reviews its own operations in light of the comparative data.

We wish to express our appreciation for the opportunity to work with you on this endeavor - one, we believe confronts issues that rank among the most urgent and complex facing college and university administrators. As you know, the Study was truly a collaborative effort; the spirit of interest and cooperation of individuals at all 12 institutions was crucially important to the Study's success. We would like to acknowledge specifically the excellent cooperation and substantive input we received from you, Richard Morrill, Norman Chmura, Robert Barr, and others of the staff of Chatham College.

Respectfully submitted,

McKinsey & Company, Inc.

COST-QUALITY STUDY

CALENDAR

1971

February	McKinsey & Company reports on the worsening financial condition of Pennsylvania's independent colleges and universities.
March	The President of Chatham College suggests to the presidents of 11 other Pennsylvania colleges and universities that the 12 institutions join in a study of ways to reduce cost without lessening academic quality.
April	Receipt of a grant for the study from the Buhl Foundation.
May	McKinsey & Company retained as consultants.
June	Chief financial and academic officers from the participating institutions meet to identify the areas of major concern.
July	After consultation with a subgroup of academic and business officers, McKinsey & Company prepares data forms for distribution to the participating institutions.
September	College and university officers complete the forms for analysis and comparisons.
October	Meeting of the presidents to review progress of the study and suggest priorities for the November workshop.
November	The presidents, top financial and academic officers meet to receive and discuss McKinsey's analysis and recommendations. The 12 institutions decide to continue as an informal group for further cooperative study and action on the problem of cost and quality. First step will be a detailed study of faculty appointment policies and practices.

1972

January	Report of the study thus far issued by the 12-college group and by McKinsey & Company.

THE TWELVE COLLEGE COST-QUALITY STUDY

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TWELVE COLLEGE COST-QUALITY STUDY

The Cost-Quality Study was undertaken in direct response to the growing financial pressures on institutions of higher learning. The fiscal crisis has now been documented by a number of studies and is rapidly becoming a matter of grave concern. The deteriorating financial condition of higher education appears to be a consequence of a fundamentally changed economic environment rather than of temporary aberrations such as high inflation or a falling stock market. In the absence of substantial new sources of revenue, the financial balance so essential to continuing strength in higher education can be achieved only as a result of actions taken by institutions themselves. The form such actions should take, however, is not readily apparent; but there is widespread apprehension that, to the extent they will involve reductions in expenditures, they must eventually lead to a lowering of the quality of educational programs.

Twelve Pennsylvania private colleges and universities hoped that the joint effort represented by the Cost-Quality Study might help to allay this concern by exploring the different patterns of resource utilization employed by this group of institutions (although they are not similar in all respects, these institutions are uniformly regarded as having high quality educational programs).

The major efforts of the study thus far have been devoted, therefore, to examining differing patterns of resource utilization. The alternative practices identified served as a basis for exploring the potential cost reduction opportunities that might be made without jeopardizing educational quality. The comparative data and analyses developed during the study were presented and discussed at a 2-day meeting* of presidents, academic officers, and business officers of the 12 institutions. This memorandum presents those data and analyses in summary form; it also describes the background and conduct of the study. The discussion is organized into four parts:

- Study origins and objectives
- Analytical approach
- Potential opportunities
- General observations.

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* - Hershey, Pennsylvania: November 16-17, 1971.

A - ORIGINS OF THE STUDY

The deteriorating financial condition of higher education generally - and of private higher education in particular - has been the subject of intense discussion during the past 2 years. Professor Earl Cheit's study of 41 representative institutions[1] led the Carnegie Commission on Higher Education to conclude that 540 private and public institutions currently are in "financial difficulty" and that another 1,000 are well on their way to that unhappy financial status. Two subsequent analyses of private higher education nationally conducted by the Association of American Colleges under the direction of William Jellema[2] dramatically demonstrated the acute deterioration of the financial condition of independent institutions. The most recent of these studies found that over 250 institutions will exhaust their liquid assets within 10 years if current levels of deficits are maintained, and that 74 were already on the verge of bankruptcy.

Our own study of the financial condition of independent higher education in the Commonwealth of Pennsylvania[3] corroborated these disquieting findings; in the 5-year period between 1965-66 to 1969-70 the aggregate current operating result declined from a $19 million surplus to a deficit of approximately $1 million; the capital deficit, during the same period, increased from $22 million to $40.6 million.

The 12 institutions participating in this current study have had experiences common to those of independent higher education generally; their financial positions, too, have deteriorated markedly in the past 5 years. For these institutions[4] the aggregate operating result for 1969-70 was a deficit of $1.2 million as contrasted with an operating surplus of $3.6 million in 1965-66.[5] (One must

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1 - The New Depression in Higher Education (1971, The Carnegie Foundation for the Advancement of Teaching).

2 - The Red and The Black (Association of American Colleges) and Redder and Much Redder (August 1971, Association of American Colleges).

3 - Study of the Financial Condition of Independent Higher Education in the Commonwealth of Pennsylvania (1971, Commission for Independent Colleges and Universities, Harrisburg, Pennsylvania).

4 - Excluding one institution for which comparative financial data was not available.

5 - When capital results are combined with operating results, the seven institutions with operating deficits in 1969-70 showed a total deficit, amounting to $8.3 million.

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keep in mind that these rank among the "wealthier and healthier" institutions in a region noted for excellence in higher education.) A pattern of increased operating deficits is clearly apparent; and projections for all the institutions suggest that, in the absence of significant alteration in the pattern of resource utilization, operating deficits will continue to grow, reaching approximately $8 million by 1975-76.

All of this evidence underscored facts already known to many in the academic community: that the growth in expenditures for educational and general purposes, student aid, administrative activities, and auxiliary enterprises has clearly outpaced the growth in revenues.

Reaction to this profound economic change has taken several forms. More public support, especially from the federal government, has been sought, and the possible Senate-House compromise on the Higher Education Bill offers some promise of modest relief. In efforts to help themselves, institutions throughout the nation have begun to eliminate some of their obviously questionable expenditures and have cut costs in such nonacademic areas as plant maintenance and administrative services. Finally, a few institutions have engaged in an earnest reexamination of their educational objectives, the academic programs required to achieve them, and the resources available to finance them. The need for such self-study has been accentuated by the realization that the alarming projections were based upon merely maintaining current endeavors - not upon the expansion of academic programs. It has become clear that if large deficits are to be avoided, the growth in expendable resources required to carry out the educational programs must be limited. Hence, a fundamental reassessment of internal resource utilization is required.

The necessity of this reassessment brought together the 12 institutions participating in the Cost-Quality Study. These institutions are among those with relatively high educational expenditures per student, and thus, by traditional measures, can be considered "quality" institutions. They decided to explore jointly the possibilities for self-help in dealing with the problems of financial stringency while maintaining or improving standards of educational quality. A collective approach to identification and examination of responses to financial problems promised a number of benefits. First, it would permit comparative analyses of how relatively similar institutions utilize resources. Second, through sharing experiences in approaches to institutional management, the participating institutions could better assess the potential of certain solutions as well as their practicality. Third, the implementation of some steps might be easier for a group of institutions than for a single institution.

B - ANALYTICAL APPROACH

The basic objective accomplished by the study has been the systematic examination of institutional operations for opportunities to reduce costs. To meet this objective two criteria had to be satisfied - first, that potential net savings be of a magnitude that would eliminate operating deficits projected for the future; and second, that the savings be realized from those activities either least essential to the vital purposes of the institution or else unduly expensive in relation to similar activities at other institutions.

In practice, the desired approach entailed: (1) focusing the study effort on those areas of operation most likely to produce the necessary savings, and (2) contrasting the alternative modes of operation of the 12 institutions to identify opportunities for improved resource utilization.

FOCUSING STUDY EFFORT

The initial diagnostic effort to determine those operations really worth examining relied heavily on institutional data available at the beginning of the study. While these initial data were at the level of detail found in the typical annual report of an institution, they provided the basis for reaching early agreement on the relative importance of the various areas.

More specifically, these data were employed to highlight the following areas of operation:

1. Operations consuming the greatest proportion of available resources, i.e., (a) instruction, and (b) administrative activities. These two areas account for approximately 70 percent of the operating budget exclusive of Sponsored Research and Auxiliary Enterprises.

2. Operations most directly contributing to deficits, in the sense that existing and growing deficits are heavily influenced by such activities. The principal area falling into this category is Student Aid. Student Aid account deficits* were the chief contributor to the relatively small net deficits of 1969-70 and are anticipated to be the cause of more than half of the projected deficits.

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* - The Student Aid account deficit is defined as the difference between revenues specifically earmarked for student aid purposes and the total expenditures for aid made by the institution; the difference is made up from general operating revenues.

3. Operations performed at significantly different costs at different institutions. When comparing expenditures per student at these institutions, it was apparent that significant variations existed in library, administrative, and student service activities.

4. Areas of particular concern to institutions, either because of their potential impact on the level of benefits which might be realized from the study or because they otherwise present special opportunities. Rank and tenure structure of faculties, cash management, and computer operations were three such areas.

COMPARING INSTITUTIONS

Having identified the institutional areas that appeared to have the greatest cost reduction potential, the study participants then examined these areas more closely. To provide a basis for this examination detailed comparative data were collected on program expenditures and outputs in each of the areas. These data would make it possible to contrast operations at the various institutions so as to reveal alternative ways of accomplishing program objectives.

Invariably, some institutions devote relatively fewer resources to particular functions than others - either because they have assigned these functions lower priorities or because they are somehow performing them more economically. In either event, a presumptive case could be made that, for those institutions devoting relatively greater resources to these functions, opportunities exist for them to reduce costs with little or no impairment to their essential programs.

While a presumptive case can feasibly be made, a conclusive case cannot - there are no "right" or "wrong" ways for an institution to allocate resources. Insofar as individual institutions have different purposes and varying strengths and weaknesses, the result of their operating decisions should be different. An underlying tenet of the study, therefore, was that there are no norms to which all the institutions should aspire. Rather, each institution should hope to gain from the study a basis for reexamining purposefully its resource allocations to see how, in light of the institutional strategy, costs might best be reduced.

Therefore, with the above objectives of developing more detailed comparative data in mind, the data collection effort was designed to serve several purposes:

1. Indicate where there are wide variation among institutions in the resources applied to accomplish given activities

2. Imply alternatives to existing policies and ways of implementing them - i.e., show how institutions operate differently, especially where a particular service is either not offered by certain institutions or offered to a more limited extent by some than by others

3. Establish a framework within which institutions can more easily identify activities requiring a level of resources inconsistent with institutional goals.

The detailed data requirements were developed by McKinsey & Company, with the assistance of a committee of academic and business officers. The data were then compiled by the participating institutions and forwarded to us for analysis and presentation at the meeting in which presidents, academic officers and business officers participated.

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C - OPPORTUNITIES FOR IMPROVING RESOURCE UTILIZATION

This section summarizes the results of our analysis of the comparative data and indicates areas for further study by each institution. The discussion is in terms of the group rather than individual institutions. This approach preserves confidentiality of data and reflects the expectation that each institution can best determine the set of actions most appropriate to its own condition.

The opportunities discussed will not be equally attractive to all institutions - not even to all that appear to devote a disproportionate share of resources to given activities. Nevertheless, we would expect that for the group, more often than not, the opportunities described below will prove to be in areas where action can be taken to reduce costs with a minimum adverse impact on institutional programs.

The areas discussed are grouped as follows:

1. Academic - including Instruction and Departmental Research, and Library operations
2. Student Aid
3. Administration, divided into
   - Academic and business functions
   - Student services
4. Cash management.

ACADEMIC AREA

In this section, we discuss two major cost areas - instruction and libraries. Together these activities account for more than half of the participating institutions' total operating expenditures, exclusive of Sponsored Research and Auxiliary Enterprises. The costs of instruction are reflected by the budget category Instruction and Departmental Research. These expenditures vary considerably among the

12 institutions* as shown in Table 1, which lists high, median, and low costs per undergraduate course enrollment within the group of institutions.**

Table 1

Instruction and Departmental Research
Expenditures Per Course Enrollment

1970-71

Average Cost Per Course Enrollment	High	Median	Low
OVERALL	$229	$139	$ 96
BY DIVISION			
- Humanities	$215	$131	$ 95
- Social Sciences	$173	$ 94	$ 77
- Science and Mathematics	$613	$163	$113

To make the variations more evident, Exhibit I shows the range of expenditures per undergraduate course enrollment among 11 of the institutions. For each institution, the bar represents the range of expenditures per course enrollment for the departments within the humanities division. For example, the first bar at the left of Exhibit I indicates that the expenditures per course registration for one department within humanities was between four and five times that of another in the same division.

The principal factors that determine instructional costs are: (1) number of faculty members, (2) faculty rank and compensation structure, and (3) clerical support. We will discuss each of these below and then take up library costs.

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* - Three of the participating institutions have substantial graduate programs, whereas the other nine are essentially 4-year undergraduate institutions. To permit comparisons, only the undergraduate programs of the universities are included. Since one of the universities was not able to submit separate graduate and undergraduate data, its data are not included in the comparison.

** - Course enrollments are the aggregate number of course registrations by students throughout the normal year (i.e., excluding summer school and extension registrations).

Number of
Faculty Members

The single most important determinant of total instructional costs is the number of full-time equivalent teaching faculty members (FTEF). To make data on numbers of teaching faculty members comparable among institutions, it is necessay to relate them to the number of course enrollments taught per FTEF (CE/FTEF). The variations in course enrollments per FTEF among the 12 institutions in undergraduate programs is shown in Table 2.* As expected, the data show that faculty workload, as expressed in course enrollments per FTEF, are inversely proportional to the costs per course enrollment shown in Table 1.

Table 2

Course Enrollments per Full-Time Equivalent Faculty Member

1970-71

Course Enrollments Per FTEF	High	Median	Low
OVERALL	154	116	82
BY DIVISION			
- Humanities	133	98	76
- Social Sciences	185	182	104
- Science and Mathematics	149	103	75

The purpose of comparing academic data among the participating institutions is twofold:

1. To determine the academic areas in which institutions should concentrate their attention on limiting numbers of faculty

2. To indicate ways to reduce the net number of faculty members needed to accomplish an institution's academic mission.

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* - The institutions represented in Table 2 are the same as those shown in Table 1, but the institution with the high costs per course enrollment has the low course enrollments per FTEF.

To this end, modes of faculty utilization among and within the 12 institutions were contrasted to provide a basis for questioning present practices. More specifically, course enrollments per FTEF in individual departments as well as major divisions - i.e., humanities, social sciences, and sciences/mathematics - were examined. Two principal conclusions flowed from these comparisons.

First, while some divisions are inherently more expensive than others, the underlying differences in faculty utilization appear to exceed any fundamental needs of the disciplines. As shown in Table 3, faculty members in the sciences on average teach fewer students than faculty members in other divisions - somewhat fewer than in humanities; significantly fewer than in social sciences.

Table 3

Comparison of Faculty Utilization in Different Divisions

1970-71

	High	Median	Low
1. $\frac{\text{CE/FTEF (Sciences)*}}{\text{CE/FTEF (Humanities)}}$	1.36	.90	.72
2. $\frac{\text{CE/FTEF (Sciences)*}}{\text{CE/FTEF (Social Sciences)}}$	1.25	.74	.50

The ratio of 0.74 in line 2 under the column headed "average" indicates that the average faculty member in the sciences in this institution teaches only 74 percent of the number of students taught by the average social sciences faculty member. This pattern, however, is not universal. For the institutions with ratios greater than one, listed in the "high" column, the science faculty teaches more students on average than the faculty in humanities or social sciences. At the other extreme, the science faculty in one institution teaches only half the number of students as the social science faculty.

Second, there appears to be little predictability (other than for foreign languages) as to whether a given department will have a high or low faculty utilization. By identifying the departments with the highest and lowest faculty utilization

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* - For all of the following tables the data shown in each column are not necessarily for the same institution.

within divisions of the various institutions, it was apparent that a given department showing relatively high utilization at some institutions might show low utilization at others. For example, at two institutions the economics department ranked among the social sciences having the lowest faculty utilization, while at three other institutions it ranked among those with the highest utilization. In Table 4, we compare faculty utilization in three illustrative departments to the average faculty utilization of departments within their respective divisions.

Table 4

Variation in Faculty Utilization in Illustrative Departments

1970-71

	High	Median	Low
1. $\frac{\text{CE/FTEF (English)}}{\text{CE/FTEF (Humanities)}}$	1.32	1.14	0.94
2. $\frac{\text{CE/FTEF (History)}}{\text{CE/FTEF (Social Sciences)}}$	1.26	0.99	0.67
3. $\frac{\text{CE/FTEF (Physics)}}{\text{CE/FTEF (Sciences)}}$	1.16	0.90	0.41

The data thus compel the general conclusion that most departments with low course enrollments per FTEF have little a priori claim on additional faculty resources vis-a-vis other departments in their divisions. Moreover, in the course of the workshop discussions, some participants saw little correlation between the degree of faculty utilization in a given department and the esteem in which the department is held within the institution. In short, it appears that low faculty utilization is frequently not planned, but rather is the inadvertent, cumulative result of past decisions. These anomolies strongly suggest that, as institutions attempt to improve resource utilization, departmental staffing levels should be critically reexamined.

Planning numbers of faculty members on the basis of utilization levels has several evident virtures. It can be justified on the basis of: (1) establishing greater "equity" for students, and (2) reaching standards of workload already existing in other departments. By equity, we mean the notion that students paying equal tuition fees should presumably receive approximately comparable resources - consistent with the valid dictates of their major disciplines. The

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second justification suggests that if average workloads within a division are consistent with an institution's academic standards, increasing workloads in low-enrollment departments generally should then be acceptable - allowing, again, for the inherent demands of the disciplines.

For illustrative purposes, we determined the impact of applying the above criterion to the departments with low faculty utilization - i.e., we calculated the number of positions that hypothetically would be reduced if workload in low enrollment departments (less than 80 percent of the division average) were increased to the division average through a reduction of faculty positions. The calculated result was that faculty members would be reduced by 2 to 7 percent among the 12 institutions. The numbers would of course be larger still if workload differences among divisions could also be reduced (e.g., the average CE/FTEF in sciences brought closer to that in humanities).

Although this approach can be justified on commonly understood grounds, it suffers from being mechanistic and arbitrary. Departmental academic strengths are derived from more subtle sources than simple student-faculty ratios. Moreover, differences in faculty utilization may be the result of deliberate institutional strategy. These considerations notwithstanding, we believe this process can be useful in challenging existing practices and questioning whether differences are in fact the result of conscious decisions.

Analyses of the kind just described suggest avenues of inquiry for determining where cost reductions are likely to have the least adverse effects. Nevertheless, if reductions are truly to have a minimum impact on quality, each institution must also reevaluate the ways in which its overall faculty fulfills its professional responsibilities. As will be shown, faculty members are employed differently at the various institutions. Consequently, we believe opportunities exist to modify curricula and modes of instruction to improve the match between faculty resources (in terms of numbers and individual strengths) and educational objectives of the institution.

To provide a framework for examining the employment of faculty members, Exhibit II relates typical faculty functions to certain illustrative educational objectives. The purpose of the matrix is to bring greater discipline to the distribution of faculty resources, in light of the particular educational objectives the individual institution is trying to achieve. This framework could prove useful in assigning instructional responsibilities as well as in recruiting and developing faculties. It is highly unlikely that each faculty member or potential faculty member is equally adept at the different forms of instruction shown in Exhibit II. To the extent an institution, in the light of its own educational objectives, can determine its overall requirements for these different instructional forms, and,

against those requirements, develop a sort of "inventory" of skills of its current faculty, the comparison should provide important guidance in faculty selection decisions.

In balancing faculty resources against educational objectives, attention may be focused on a number of choices among conflicting demands. Examples of the types of actions likely to be considered include:

- Shifting modes of instruction, to limit the incidence of the small seminar in favor of larger lectures supplemented by some additional tutorials
- Reducing number of courses
- Placing greater educational burden on students, through use of independent study (without heavy reliance on faculty members)
- Reducing the requirements for faculty time in science laboratories
- Limiting the purposes for which faculty members are released from teaching assignments.

The specific actions taken must balance the capabilities of faculty members against the needs of students as determined by students' level of preparation for higher education and the dictates of major disciplines. With this caveat in mind, the significant differences that exist among the 12 institutions in academic practices suggest that there are opportunities to make changes, such as those listed above, that will permit reductions in numbers of faculty with little or no harm to overall programs. This point can be illustrated with comparative data on: (1) number of courses, (2) incidence of independent study, (3) relative demands of laboratories on faculty time, and (4) use of released time to support administrative functions.

Table 5 contrasts institutions in terms of the total number of undergraduate courses offered and cites, as a specific example, the number of courses offered in history.

Table 5

Number of Courses Offered

1970-71

	High*			
	University	College	Median	Low
Total Liberal Arts and Sciences courses	507	439	379	264
History Courses	63	43	27	18

The fact that all of the institutions in this group offer what are generally considered to be quality programs suggests that those offering large number of courses have the potential for substantial savings through curriculum redesign.

Table 6 similarly illustrates the large dissimilarities that exist in the use of independent study.

Table 6

Variation in Incidence of Independent Study

1970-71

	High	Median	Low
Percent of total course enrollments represented by independent study	11%	2%	0.6%

To the extent that independent study can represent net reduction of demands on faculty time and a different, but nevertheless high quality educational experience

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* - Where this report presents data for high, median, and low institutions, only, all 12 institutions are included. In some instances, conditions at universities are considered sufficiently unique that high, median, and low data are presented for 8 colleges; the high (or low, as appropriate) university data are shown separately.

for students, institutions appear to have an opportunity to increase this mode of instruction.

Variations in the faculty time devoted to laboratory programs, shown in Table 7, are a result of different implicit policies regarding: (1) fraction of science courses with laboratory requirements, and (2) fraction of laboratories staffed by faculty members (as opposed to paraprofessionals or students). These differences are shown in Table 7 for three science departments that exist in virtually all of the institutions.

Table 7

Laboratory Requirements

1970-71

	High	Median	Low	
			College	University
Fraction of courses with laboratory requirements				
- Chemistry	1.00	0.76	0.37	0.26
- Physics	1.00	0.60	0.46	0.16
- Biology	0.96	0.74	0.38	0.25
Fraction of laboratories with faculty				
- Chemistry	1.00	0.58	0.35	0.24
- Physics	1.00	0.82	0.41	0.54
- Biology	0.95	0.48	0.41	0.80

The last set of comparative data concerns the release of faculty members from teaching duties while they are performing administrative duties - e.g., serving as departmental chairmen. The data among institutions are not strictly comparable in that some institutions pay faculty additional compensation for performing administrative roles rather than assigning reduced teaching loads. Nevertheless, seven institutions report faculty released time varying from the equivalent of 1.2 percent of total teaching faculty to 7.4 percent. Some institutions apparently consider that, given the experience and naturally higher compensation of senior faculty members, the duties of departmental chairmen should be assumed by them without released time allowance.

Faculty Rank and
Salary Structure

In addition to the number of faculty members, the factors that determine total cost of faculty are the rank and tenure of faculty members and the salary structure. While these factors offer lower leverage in reducing costs than does the reduction in numbers, they are still of sufficient importance as a potential source of savings that they should not be overlooked in considering cost-quality problems.

Differences among the 12 institutions in the relative seniority of faculty members is marked, the proportion of total faculty accounted for by full and associate professors varying from a low of 39 percent to a high of 54 percent. The economic importance of these figures can be appreciated when it is noted that a downward shift of 5 percent in senior faculty members as a proportion of all faculty members (keeping total number constant) would produce savings of about $30,000 annually for one of the average-sized institutions in the group. An upward shift in seniority of faculty causes total faculty costs to rise more rapidly than the growth rate of the average individual faculty member's salary. As can be seen in Table 8, the median institution in the group experienced an increase of 1.4 percent in full and associate professors as a proportion of faculty during the period 1968-69 to 1970-71. For one institution, the increase amounted to 4 percent. At the other extreme, one institution was able to achieve a significant reduction in this ratio.

Table 8

Change in Percentage of Senior Faculty

	High	Median	Low
Change in percentage of Full and Associate Professors of total Faculty from 1968-69 to 1970-71	+4%	+1.4%	-3%

In the discussions at the Hershey meeting, it became clear that in most institutions existing practices with regard to faculty promotions will cause the proportion of full and associate professors to increase over the next 2 years.

A related measurement, shown in Table 9, is tenured faculty.

Table 9

Percentage of Senior Faculty

1970-71

	High	Median	Low
Tenured faculty as a percent of total faculty	66%	46%	33%

The greater the proportion of faculty members holding tenured appointments the less flexibility the institution will have in reducing the number of faculty members. As Table 9 shows, the percentage of tenured faculty varied from a low of 33 percent to a high of 66 percent. From additional data collected at Hershey, it was apparent that a number of institutions expect as much as two-thirds of their faculty to be tenured within the next 3 to 5 years.

Table 10 shows the range and median of the average salaries of the participating institutions. While the overall range is significant, there is not a material spread between the median average salary of $12,962 and the low of $12,047. In the long run, average salary levels are by and large a function of the "market place" and thus do not represent an area of high potential savings.

Table 10

Faculty Salary Levels

1970-71

	High	Median	Low
Average Faculty Salary	$14,938	$12,962	$12,047

Clerical Support

The final area of comparison among institutions in instruction-related costs is in the amount of clerical support provided to the faculty. Table 11 shows the variation in number of full-time equivalent faculty members for each clerical

support person. While some potential for savings exists, this area cannot be regarded as providing a major opportunity for cost reduction. It may be, however, that in those cases where there is a savings potential, this type of reduction is among the least objectionable in the academic area - i.e., it is less directly related to the instructional process than, for example, class size.

Table 11

Clerical Support for Faculty

1970-71

	High	Median	Low
Number of FTEF per clerical support personnel	31	11.6	6.5

Library

The remaining academic area to be discussed is library operations. In 1969-70, financial data on total library expenditures per student showed marked variations among the 12 participating institutions - from approximately $80 to $450.

The cost-quality analyses examined several specific areas of library operation that account for the large overall variations in cost: (1) service support personnel, (2) technical support personnel, and (3) expenditures for books and periodicals. To understand these variations in cost, it is necessary to relate manpower and dollar expenditures to appropriate activity levels. Table 12 compares three such measurements.

Table 12

Library Operations

1970-71

	High	Median	Low
Circulation per service personnel	$15,432	$10,046	$5,557
Books added per technical personnel	2,938	1,403	756
Expenditures for books and periodicals per FTEE	148	58	35

The variations among institutions suggest the possibility of reduction opportunities through: (1) increasing the productivity of support personnel, and (2) limiting expenditures for books and periodicals. In examining low productivity, it is necessary to question both the rate of personnel utilization and importance of the number and level of services provided. Similarly, priorities for new purchases should be examined to see if basic support of academic programs can be provided at lower cost - i.e., if a significant fraction of total expenditures is for items that receive little or no usage. This is an area where practices can evolve over time without sufficient recognition of the economic consequences.

STUDENT AID

In considerable measure, the dramatically increased costs of higher education have been shifted to the ultimate consumers, the students. The transfer of increased expenditures has been manifested through rising tuition, fees, and room and board costs. And because private institutions of higher learning have traditionally assisted those with limited financial means in meeting the costs of higher education, student aid expenditures have expanded correspondingly. A further upward pressure on student aid costs has been the recent special efforts to enable the economically disadvantaged and minority group students to participate fully in higher educational opportunity.

In this section we:

- Examine current student aid expenditures and their recent growth
- Describe the alternative forms of student aid employed by participating institutions
- Analyze the more recent efforts to provide educational opportunity to economically disadvantaged and minority group students.

Student Aid Expenditures And Growth

During the 1970-71 academic year, students at the 11 institutions submitting student aid data received over $16,000,000 in financial aid from the institutions and other sources. For those institutions reporting comparable data for the 1968-69 academic year, the amount of financial aid received by all students had grown 23 percent over the 2-year period. The percent of increase over the 2-year period varied among institutions from 11 to 50 percent.

Undergraduate student aid for the "typical" reporting institution amounts to 24 percent of the revenues* received from all undergraduates; the range for all institutions was between 18 and 31 percent. Typically, 35 percent of undergraduates receive some financial assistance, and there is a wide variation among the institutions - from 22 to 43 percent - in the proportion of students aided. Although the percentage of students who receive aid shows some correlation with tuition and other costs of enrollment, the latter range is not particularly wide (from $3,000 to $3,800, with most at the $3,400-$3,500 level); moreover, some institutions with costs at the lower end of the scale have the highest percentages of students aided.

In addition to the growing proportion of resources devoted to student aid, there is a growing variance between the funds specifically available to institutions for student aid (e.g., income restricted for that purpose, restricted gifts, special funds) and institutional expenditures. For the 1970-71 academic year, the 11 institutions for which we had earlier (1969-70) financial data reported "deficits"** in their student aid accounts aggregating to over $4 million; these deficits were largely offset by surpluses from other accounts (e.g., educational and general, research, or auxiliary enterprises). According to our projections, these negative results in the student aid accounts will grow to an aggregate of nearly $8 million during the 1975-76 academic year.

Alternative Forms Of Student Aid

A wide variety of student aid instruments can be employed to assist students in meeting their financial needs:

- Institutional grants are those institutional funds awarded to students by the college attended. These funds come from endowment income and gifts restricted for the purpose of student aid and from the general revenues of the institution, including tuition revenues and unrestricted gifts and endowment income.

- Outside scholarships are those which are financed and administered by groups outside the institution. Examples include National Merit Scholarships, ROTC Scholarships, and state scholarships other than those awarded by the Pennsylvania State Scholarship Program (PHEAA).

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* - Tuition, fees, room and board.

** - As used here, the term deficit means that expenditures for student aid were greater than revenues specifically earmarked for that purpose.

- Educational Opportunity Grants are awarded to economically disadvantaged students by the individual institutions, utilizing funds provided specifically for that purpose by the U.S. Office of Education.

- PHEAA - Pennsylvania Higher Education Assistance Agency grants.

- Institutional loans are those loan funds administered by the institution. National Defense Student Loan (NDSL) program funds are included in this category as well as institutional loan funds.

- Guaranteed Loan Program consists of those loans administered by commercial lending institutions and guaranteed by the federal or state governments.

- Employment consists of jobs held by students during the academic year and includes participation in on campus work study programs.

Institutions reported utilizing these various forms of aid in differing proportions. Table 13 below indicates the distribution of aid forms for two institutions and the average for all participating institutions.

Table 13

Variations in Alternative Undergraduate Student Aid Forms

1970-71

Type of Aid	Institution Y	Institution Z	Average
Institutional scholarships and grants	22%	47%	32%
Outside scholarships	16	5	10
Educational Opportunity Grants	4	2	4
PHEAA	13	8	14
Institutionally administered loans	19	13	11
Guaranteed Loan Program loans	23	21	19
Jobs	3	4	10
	100%	100%	100%

Exhibit III shows the variation in student aid mix among eight of the institutions. The utilization of various aid forms heavily influences the actual cost to the institution of its student aid program. For example, institutional scholarships and grants are clearly the most expensive form of aid, because they use funds that for the most part could be used for other institutional purposes. The funds are not repaid, as are loans; and no service is required in return as is the case for funds expended on work programs.

Also, the use of other, noninstitutional funds (e.g., outside scholarships and loan funds and various governmental aid programs) is economically preferable, although the sources of funds are likely to be less stable since the amounts are not entirely determined by the institution. By placing heavier emphasis on outside funds, some institutions are able to offer those of limited financial means the same level of assistance - at less cost to the institution. In effect, they are able to leverage their own funds to produce a more cost-effective mix of aid.

Assisting Economically Disadvantaged and Minority Group Students*

Although the participating institutions have always assisted the financially less able in meeting the costs of higher education, recent concerted efforts have been aimed specifically at assisting severely economically disadvantaged and minority group students in participating fully in educational opportunities. Fulfilling these social and educational objectives has been - and will continue to be - an expensive effort.

Economically disadvantaged students. Although economically disadvantaged students** constitute only about 6 percent of all undergraduates, they receive 23 percent of all undergraduate financial aid in 1970-71. Institutions reported differing proportions of economically disadvantaged students in their student bodies and correspondingly disparate percentages of funds committed to assisting this group. The proportion of economically disadvantaged undergraduate students ranged from 3 to 11 percent; and the percentage of aid received by such students ranged from 11 to 46 percent. In general, nearly all (99 percent) of the economically disadvantaged students received some form of student aid.

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* - These groups are not mutually exclusive.

** - They are those students meeting the federal government criteria, i.e. students whose families have incomes of less than $9,000 and whose parents can contribute less than $625 per year as reported on the College Scholarship Service form.

From 1968-69 to 1970-71, assistance to the economically disadvantaged increased at a rate slightly less than that for all student aid, indicating that the proportion of total student bodies accounted for by this group may have begun to stabilize. For those institutions* reporting data for both academic years, the amount of all student aid rose 27 percent while aid to the economically disadvantaged rose by 22 percent. During the same periods, the number of economically disadvantaged students on these campuses increased by 12 percent.

As Table 14 below demonstrates, economically disadvantaged students received a mix of aid different from that received by all students. The economically disadvantaged typically received a larger share of their funds in EOG and institutionally administered loans and a smaller share of outside scholarships, PHEAA and GLP loans than did all aid recipients.

Table 14

Undergraduate Student Aid Mix

(Including GLP Loans)

1970-71

Type of Aid	All Students	Economically Disadvantaged
Institutional scholarships and grants	32%	32%
Outside scholarships	10	6
Educational Opportunity Grants (EOG)	4	20
PHEAA	14	11
Institutionally administered loans	11	15
Guaranteed Loan Program (GLP) loans	19	7
Jobs	10	9
	100%	100%

In addition to the difference in the form of aid received by economically disadvantaged and other students, institutions varied in the

* - Not all institutions reported for both years.

mix of aid forms in meeting the needs of disadvantaged students. Table 15 demonstrates the reported variations in alternative forms of aid received by economically disadvantaged undergraduates.

Table 15

Variations in Distribution of Undergraduate Student Aid Forms to Economically Disadvantaged Students

1970-71

Type of Aid	Institution Y	Institution Z	Average
Institutional scholarships and grants	22%	62%	32%
Outside scholarships	9	3	6
Educational Opportunity Grants (EOG)	20	10	20
PHEAA	15	7	11
Institutionally administered loans	20	13	15
Guaranteed Loan Program (GLP) loans	8	3	7
Jobs	6	2	9
	100%	100%	100%

Minority group students. Minority group students - some of whom are also economically disadvantaged - constitute about 5 percent of the aggregate undergraduate student population and receive about 13 percent of undergraduate financial aid. The proportion of minority group students on all of the campuses included in the study ranges from 1 to 10 percent; the percentage of all student aid devoted to minority group students ranges from 3 to 26 percent. In the aggregate, 84 percent of minority group students receive aid although the precentage receiving aid at the various institutions ranges from 51 to 100 percent.

Aid to minority group students has risen at a rate nearly three times that for the general increase in student financial aid. For the institutions reporting data for the 1968-69 and 1970-71 periods, aid to minority group students rose 78 percent, while total undergraduate student aid increased by 27 percent. This 78 percent increase in aid was accompanied by a 79 percent increase in the number of minority group

students, indicating the growth in aid per minority group student has stabilized. The aggregate proportion of minority group students in the undergraduate student bodies increased from 3 to 5 percent in the same period.

One implication of the marked increases in the numbers of minority group students and the amounts of aid they receive is that institutions have committed themselves to still further increases in student aid expenditures. Recent increased enrollments of minority group students have been concentrated in the freshman and sophomore classes. Maintaining current policies - i.e., admitting the same fraction of minority group students in the future - will increase the proportion of minority group students to 7 percent of overall enrollment by 1972-73. If previous experience is borne out, substantial amounts of additional aid will be necessary to assist these students.

Table 16 demonstrates the marked difference between the aid mix received by minority group students and that received by all students. Minority group students typically shared more heavily in institutional scholarships and grants and EOG funds than did all aid recipients; but they generally received a lesser share of aid in the forms of jobs, GLP loans and PHEAA grants. Participation in outside scholarships and institutionally administered loan programs was about equal for minority group and all other aid recipients.

Table 16

Undergraduate Student Aid Mix

(Including GLP Loans)

1970-71

	All Students	Minority Group Students
Institutional scholarships and grants	32%	48%
Outside scholarships	10	8
Educational Opportunity Growth (EOG)	4	14
PHEAA	14	6
Institutionally administered loans	11	11
Guaranteed Loan Program (GLP) loans	19	7
Jobs	10	6
	100%	100%

As in the case of economically disadvantaged students, the distribution of aid forms to minority group students among the reporting institutions was not uniform. Table 17 below shows the mixes of aid forms employed to assist minority group students.

Table 17

Variations in Alternative Undergraduate

Student Aid Forms to Minority Group Students

1970-71

Type of Aid	Institution X	Institution Z	Average
Institutional scholarships and grants	27%	70%	48%
Outside scholarships	10	5	8
Educational Opportunity Grants (EOG)	18	6	14
PHEAA	10	1	6
Institutionally administered loans	20	13	11
Guaranteed Loan Program (GLP) loans	7	3	7
Jobs	7	2	6
	100%	100%	100%

* * *

From these analyses, two central questions arise. First, can private educational institutions continue to bear so great a share of society's responsibility for providing educational opportunity to the financially handicapped? This question is not one of determining whether students should be aided or of denying the educational values associated with socially and economically heterogeneous student bodies. It is a question of who should assume what portion of society's responsibility to provide financial assistance. It can be argued that it is a public responsibility and, as such, should be borne by government. In any case, institutions facing the prospect of scarce resources will not be able to escape the hard decisions involved in balancing financial commitments to this form of social investment with those that determine the scope and quality of other activities central to their missions.

Second, given the objective of providing educational opportunity to the financially handicapped, can the cost to institutions be reduced by altering the mix of alternative forms of aid? In light of the range of practices and policies with respect to the forms of aid utilized by various institutions, a number of colleges should be able to effect considerable cost savings by adjusting their aid disbribution while maintaining the level of their assistance to students (e.g., by placing more emphasis on loans, employment, and outside sources of aid).

ADMINISTRATIVE AND STUDENT SERVICES

The next aspect of institutional operation examined involved administration and student services. It had been clear from the data already available at the start of the study that General Administrative expenses (including academic administration and student services), as a percentage of total operating expenditures, varied considerably among institutions. The range of these ratios and the median in 1969-70, for 11 institutions for which data were available, are shown in Table 18 below.

Table 18

General Administrative Expenses as a Percentage

Of Total Operating Expenditures

1969-70

High*	Median*	Low	
		College	University
24%	16%	14%	10%

There are some problems of accounting treatment in interpreting these results, but it appears unlikely that they cause all the range of variation. A more important difficulty in interpreting the results is the proper weight to be given to differing economies of scale in operations. In our analyses, administrative functions and student services were reduced to a per-student basis (e.g., although a case can be made that faculty as well as students benefit from a number of administrative services).

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* - Both these institutions are colleges rather than universities.

Differences in cost per student among institutions can be caused by a number of factors. One is the varying size of student bodies. Hence, within those functions that must be performed regardless of the number of students enrolled, larger institutions may benefit from economies of scale. Nevertheless, in many instances institutions of equal size also reported disparate costs per student. In fact, in some cases, small institutions reported the lowest costs per student. Throughout the analyses, instances were noted where economies of scale appeared to be important determinants of costs per student.

Since a large proportion of the cost of administrative functions and student services are personnel costs, it is not surprising that many of the differences in cost per student are due to the intensity of utilization of professional and support personnel. Where an institution shows lower utilization rates (in terms of the number of students served per administrative or professional personnel) than other comparable institutions, it can be presumed that opportunities for cost reduction exist. However, in subsequent evaluations of these operations, the institutions must determine if the relatively greater resources expended per student are a result of conscious policy decisions, the result of historical happenstance, or just plain managerial inefficiencies.

Another obvious factor contributing to differences in cost per student is the type of service offered. For example, some institutions commit sizeable resources to particular services (e.g., mental health care or placement activities) while others do not. A thorough examination of the relative costs and benefits of each form of service is an essential starting point in a search for cost-reduction opportunities.

In the two sections that follow we present summary findings and explanations of differing costs per student for administrative functions and student services. The first section examines: (1) the purely administrative functions of the president, chief academic officer, departmental administration, and chief business officers; and (2) computer services. The second section explores: (1) student service activities (including admissions and financial aid administration, health care, counseling, and registrars' offices); and (2) athletics.

Administrative Services

Purely administrative services are grouped under the categories of academic administration and functions of chief business officers. Computer services are also discussed in this section.

¶ Academic administration. Academic administrative duties are performed by a variety of academic officers: presidents, chief academic officers (provosts), and department chairmen. Table 19 shows costs

per student for these combined functions and certain dollar and statistical data for individual components as well.

Table 19

Academic Administration

1970-71

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	High			
	University	College	Average	Low
Expenditure/FTEE: All Academic Administration	$283	$260	$157	$ 76
A. Expenditures/FTEE: President's Office	31	179	64	40
B. Expenditures/FTEE: Chief Academic Officer	207	81	63	25
C. Expenditures/FTEE: Departmental Released Time	45	0	28	11
D. FTEE/FTE Professionals (excluding released time)	116	148	238	336

Our analyses indicated that while economies of scale contributed to the wide gap of differing expenditures in these areas, a number of similarly sized institutions incurred markedly different expenditures per student. The large universities reported higher costs per student, probably because of the more specialized tasks associated with their more complex organizations and with relatively larger research activities.

¶ Chief business officers. As in the case of academic administration, institutions reported wide variances in the expenses per FTEE associated with the business office. Such expenditures tended to be heavily influenced by economies of scale, although within similarly sized institutions variances of up to $93 per student existed. University expenditures per student again were higher than those reported by colleges probably for the same reasons cited for academic administration. As expected, the primary cause of such differences in per student expenditures appears to be the utilization of professional personnel.

Table 20

Chief Business Office

1970-71

	High			
	University	College	Average	Low
Expenditures/FTEE	$232	$167	$102	$ 44
FTEE/Professional	115	210	407	616

¶ Computer services. As many institutions reported owning their computer hardware and almost all indicated a high degree of utilization, little opportunity is apparent for achieving savings through consolidation or sharing most development costs. Not all institutions, however, fully utilize the computer for administrative tasks, so the possibility exists that, for some institutions, future development costs might be minimized by making use of software systems developed by other colleges and taking advantage of time-sharing arrangements for hardware.

Decisions to make such arrangements will necessitate individual institutional analyses to determine the systems available through other institutions and the practicality of having administrative data processing tasks performed elsewhere. Such arrangements could be facilitated by more formal cooperative arrangements than now exist. A mechanism for reviewing any future hardware acquisition plans should take into account all institutions' computing needs to encourage consolidation of new systems-development plans.

Student Services

Student services are grouped in five categories:

¶ Admissions and financial aid. Administrative expenditures associated with the admissions and financial aid activities of participating institutions are characterized by economies of scale in that expenditures per FTEE diminish as total FTEE increases. Hence, this area does not present a major opportunity for savings.

¶ Health care. As Table 21 shows, health care expenditures per student varied widely and did not seem to be heavily influenced by economies of scale except in the cases of the large universities. Institutions of

similar size reported wide variances in the number of students served by full-time-equivalent professional personnel.

Table 21

Health Care Services

1970-71

	High	Average	Low College	Low University
Expenditures/FTEE	$96	$48	$28	$27
FTEE/Professional	481	1,036	1,850	1,432
Percent of expenditures for mental health (for above institution in each column)	32 (est.)		0	40

The wide variations reported by institutions represented in the table were a reflection of:

- Utilization of professional personnel
- The level of services offered, especially in the field of mental health care.

Perhaps the greatest cause of the variations in health care costs per student is the level of mental health services provided. Institutions commit from zero to 50 percent of their total health resources to mental health services. All of the institutions with above-average health care costs per student provide substantial mental health services.

¶ Counseling. Institutions reported differing costs per student for the activities for which the deans of student affairs are responsible and provided widely disparate levels of service in testing and counseling, placement and other counseling services.

- Deans of student affairs. Expenditures per FTEE vary considerably and in large measure reflect the differing utilization of professionals shown in Table 22. Economies of scale are not particularly evident, except in the cases of the larger universities.

Table 22

Deans of Student Affairs

1970-71

	High	Average	Low College	Low University
Expenditures/FTEE	$86	$48	$35	$22
FTEE/Administrator	240	513	661	1,074

- Testing and counseling services. Only 5 of the 12 institutions have explicit organizational units for this purpose. Where testing and counseling services are offered, they are generally carried on by a small number of personnel. Nevertheless, the cost per student ranged from $6 to $27.

- Placement offices. Nine of the twelve institutions provide placement services, with expenditures ranging from $4 to $27 per student in 1970-71; the average was $13. Because many placement offices are "one-man" operations, economies of scale are an important factor in the wide variation in costs per student.

¶ Registrars' offices. Utilization of support staff (nonprofessional and clerical personnel) appears to be the key determinant of the disparities in costs in the registrars' offices.

Table 23

Registrars' Office

1970-71

	High	Average	Low College	Low University
Expenditures/FTEE	$38	$26	$13	$20
FTEE/Support Staff Personnel	187	503	617	613

¶ Athletics. Recently, a number of institutions have effected cost reductions by altering athletic programs. Institutions participating in this study reported greatly divergent total expenditures for athletic programs - from almost nothing to nearly $500,000 annually. Institutions of similar size also reported widely disparate expenditures for athletics. In every case, revenues from athletic events fall short of related expenditures. Most institutions reported great difficulty in allocating costs to the various components of athletic programs (e.g., intercollegiate, intramural, and physical education activities). Of those institutions that attempted to calculate such breakdowns, however, it was apparent that the ones with the greatest athletic expenditures devoted the highest percentages of their resources to intercollegiate competition.

As each institution compares its own data with the ranges of administrative and student services data shown above, the functions performed and objectives served need to be identified in sufficient detail to answer the question: "If costs were reduced by 'x' percent, which functions would have to be (1) eliminated? **or** (2) performed at lower cost?" Only by tenacious adherence to this line of questioning can the most fruitful possibilities for resource reallocations be identified.

CASH MANAGEMENT

Our analyses of the management of cash at participating institutions suggest that substantial revenues can be realized through improved management of balances carried in bank accounts. As the table below shows, institutions maintain varying average monthly demand bank balances.

Table 24

Demand Deposit Levels

1970

	High			
	University	College	Average	Low
Average monthly bank balance ($000)	$913	$685	$469	$54
Percent of average monthly expenditure	11%	49%	34%	8%
Estimated additional revenue from reduced cash balances ($000)	$ 19	$ 25	$ 18	-

We estimate that for eight of the institutions included in the study, aggregate savings of up to $150,000 annually can be realized by reducing the level of bank balances. In one instance alone, the estimated saving was $25,000. To make these estimates of potential earnings, we employed analytical techniques widely used by industrial concerns to determine the appropriate levels of their bank balances. The first step in this analysis is to price out, at current competitive prices, the costs incurred by the bank in processing and clearing each institution's checks and deposit items for a year and any other specific services performed by the bank. The second step is to determine the average loanable balance necessary to compensate for these services. This balance can be determined by dividing the total activity cost by an estimated earnings allowance (e.g., 5 percent). The third step is a determination of the amount of balance necessary to fulfill the reserve requirements set by the Federal Reserve System. As institutions were unable to report "collected balances" averages (a figure, available from the banks, representing the bank balance of collected deposits), we assumed funds in collection at one day's average receipts, a measure found applicable in other cash management studies.

The sum of the average loanable balance, the reserve-requirement balance and funds in collection can be considered a "fair" balance. For each institution, we then compared the "fair" average balance with their actual reported average balance. The excess of actual balance over fair balance could be invested in income producing investments providing additional revenue. Hence, the amount of these earnings becomes a target for improving the institution's investment earnings through better management of bank balances.

Reducing bank balances, of course, involves negotiation with banks. Institutions frequently enjoy banking services and relationships that are hard to measure in the analyses. The procedure suggested above should provide a broad measure of how much those intangibles are costing the institution in terms of investment revenues foregone and thus indicate whether they are worth the cost.

In addition to reducing cash balances in demand accounts, it is likely that investable funds (and hence income) can be increased by certain internal cash management techniques.

Steps that some institutions have already taken along these lines include:

1. Expediting deposits to bank accounts

2. Planning cash flows, especially unusually large ones, well enough in advance to ensure that funds are not unnecessarily tied up

3. Ensuring that vendor's invoices are not paid before their due dates

4. Arranging to have tuition payments made directly to banks through "lock box" arrangements. *

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* * *

The preceding sections of this report encompass the major aspects of an institution's operation, and any useful review of these represents a sizeable undertaking. As an institution approaches the task of reexamining its operations in line with the above discussion, two basic questions will inevitably be asked: (1) "Is it worth it?" and (2) "how do we go about it?"

With regard to the first question, we return to one of the initial criteria employed in determining areas of study concentration - i. e., cost reductions should have the potential of eliminating the operating deficits projected for 1975-76. While we obviously cannot foresee the specific steps to be taken by individual institutions, we did attempt as part of the study to assess the potential for savings.

To arrive at this potential, we applied the identified opportunities to a "composite institution." This composite institution was formed by compiling the data from a selected number of the 12 participants that appeared to us to be reasonably

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* - Some institutions have also been able to decrease their own clerical loads at peak periods through "lock box" arrangements.

representative of the whole group - not so much in magnitude as in terms of applicability of the improvement opportunities identified. The projected operating deficit of this "institution" was about $1.7 million - approximately 4.5 percent of expenditures. If the composite institution were to be successful in realizing opportunities in the areas discussed above, we estimate the savings would be approximately $1.5 million. These would be distributed as follows: faculty (44%), library (4%), administration (18%), athletics (16%), student aid (13%), and cash management (5%). Even though this exercise is fraught with a host of uncertainties, the results are substantial enough that, with a generous allowance for error, the effort, indeed, appears worthwhile.

As we have emphasized throughout this study, each institution must choose its individual approach to improved resource utilization - one tailored to its own purposes and objectives and consistent with the severity of its financial stress. This study did not deal with individual institutional strategies, and thus it cannot result in a specific list of recommended courses of action for each to follow. Implicit in all of our discussions, however, is a process any institution can follow. To help make that process more explicit, we list a set of questions in the Appendix that might be asked by each institution in light of what it now knows about itself in relation to other institutions. We believe these will be helpful in guiding the searching reexaminations we hope will grow out of the Cost-Quality Study.

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D - CONCLUDING OBSERVATIONS

In addition to presentation of the results of the Cost-Quality Study discussed above, some observations regarding the outcome and the practical difficulties of such a study are appropriate. These observations may help to place the first phase of the Study results in a more understandable framework and also provide useful guidance for other groups of institutions attempting similar studies in the future.

The principal types of problems we anticipated in advance of the Hershey meeting, and which ultimately proved to be troublesome, include those associated with the quality and interpretation of comparative data. The objectives of the Cost-Quality Study place great weight on the use of comparative data to establish, for analytical and discussion purposes, those significant differences in resource utilization existing among roughly similar institutions. Understandably, the more dissimilar the institutions were, the more imperfect the comparisons could be.

In one sense, the Study does involve comparable institutions - i.e., they all are well regarded, with expenditures per student well above the national average for independent institutions. Nevertheless, significant differences in mission, size, and available resources do exist among the participating institutions. The most important differences occur between the predominantly 4-year liberal arts institutions and the large universities with substantial research programs and a number of graduate and professional schools. While an attempt has been made to isolate the undergraduate portion of each university's academic program for comparison with other undergraduate programs, the comparison remains imperfect. For example, the indirect influence of research funds on undergraduate studies was necessarily ignored because quantifiable description was not possible. The result is, in the cases of large universities and small colleges, a weakening of the presumption that institutions have much to learn from one another. On the other hand, all of the institutions involved were enthusiastic over the first phase of the study and felt further cooperative explorations well worth pursuing.

Even among basically similar institutions, two potential problems are bound to arise: (1) comparative data are indicative, not conclusive; and (2) data sources at most institutions are designed primarily to serve fiscal rather than resource-management requirements. This latter condition must be regarded as a basic weakness in the information systems of colleges and universities.

To serve the needs of the cost-quality kind of examination, data should be both broad enough yet sufficiently focused to cover major aspects of institutional operations and at the same time concise enough to be discussed in the course of

necessarily brief workshops. Ideally, data should permit general diagnoses, such as the indication that an institution is devoting greater or lesser resources to performing a set of functions than are comparable institutions; they would necessarily not permit determinations that specific levels are either "right" or "efficient." Such conclusions require in-depth, institution-by-institution analyses. Comparisons within the context of group discussions should stimulate questions concerning minimum levels of service. That is, comparative data should be viewed only as a further source of information to be considered in evaluating claims on resources. The tendency exists, however, for some officers in institutions to look to the data for conclusive answers concerning the optimum levels of resources to be devoted to various functions. To the extent that such expectations are held, the potential opportunities provided by the comparative data will not be fully exploited.

The second potential difficulty mentioned above is that resource utilization data are often not available in the most useful form. For most institutions, data are usually tailored to meet fiscal accounting requirements and, therefore, are not program oriented. Hence, it is often difficult to isolate the resources applied to given programs or functions. Many areas include functions for which there are not generally agreed-upon standards - those included under the heading "President's Office," for example. Even if there were agreed-upon standards, existing information systems are ill-equipped to provide corresponding data. In any event, within the current capabilities of institutions to provide data, approximations are necessary, and comparisons must be made with adequate allowance for the limitations of the data.

In spite of these difficulties, we conclude that most of the participants have thus far derived essentially the results that had been hoped for. We believe most of them have:

- A greater awareness of the issues involved
- An analytical framework for pursuing opportunities to modify allocation of resources at their individual institutions
- An agreement to continue working together as a group, or as subgroups in selected areas, in facing the financial difficulty that lies ahead.

The ultimate test of the results of the Study will lie in the actions taken by each institution to maintain the essentials of its educational programs within the resources it can bring to bear during the coming months and years.

VARIATIONS IN EXPENDITURES PER UNDERGRADUATE HUMANITIES COURSE-ENROLLMENT AMONG AND WITHIN INSTITUTIONS 1970-71

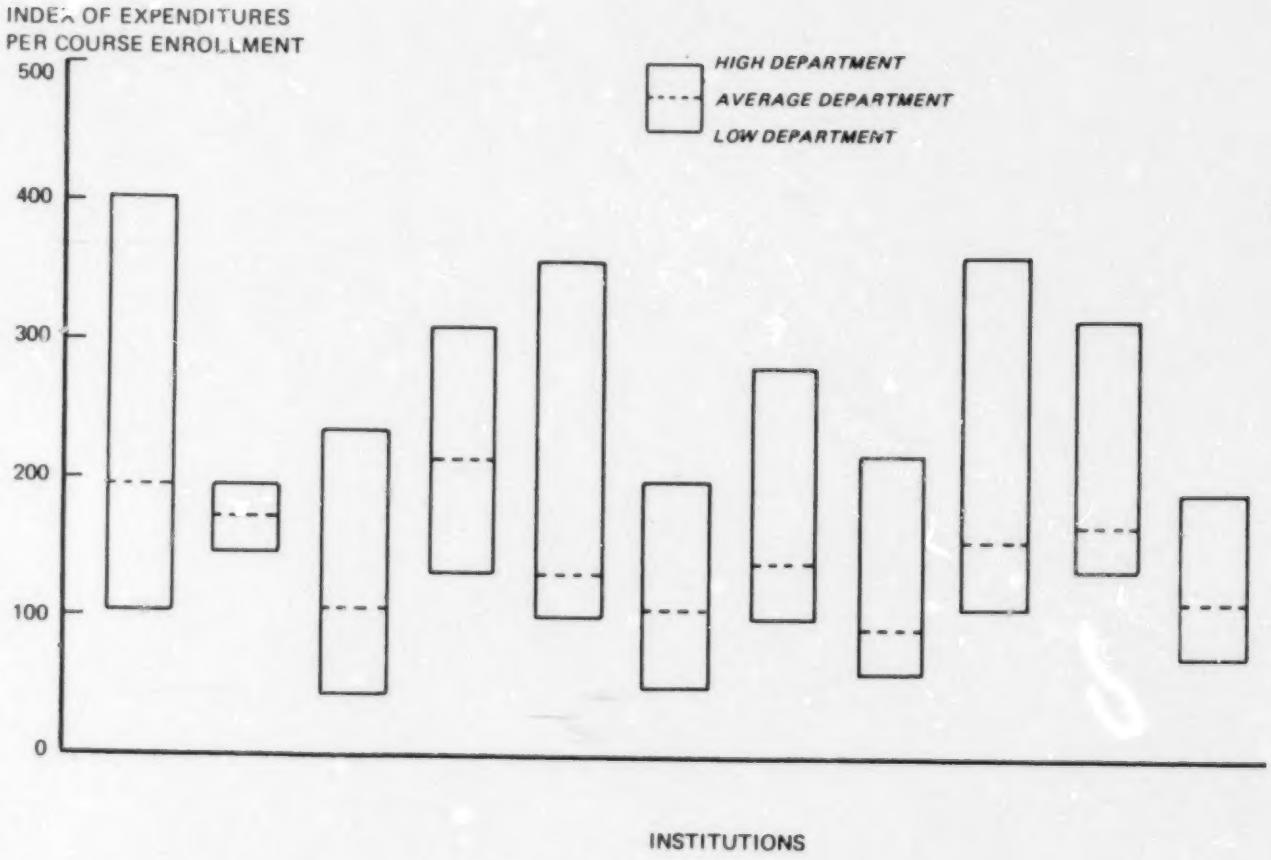

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Exhibit I

RELATING FACULTY FUNCTIONS TO STUDENT NEEDS

EDUCATIONAL OBJECTIVES	FACULTY FUNCTIONS						
	INSTRUCTION			SCHOLARSHIP	COUNSELLING	RELEASE TIME	RESEARCH
	Lecture	Seminar	Independent Study				
ANALYTIC*							
EXPERIENTIAL & INTERACTIVE**							
FACTUAL							
OTHER							

* *E g., logic, quantitative skills, written and oral expression - the development of reasoning powers*

** *E.g., learning by doing, group association.*

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Exhibit II

UNDERGRADUATE STUDENT AID (INCLUDING GLP)
TYPE DISTRIBUTION
1970 - 71

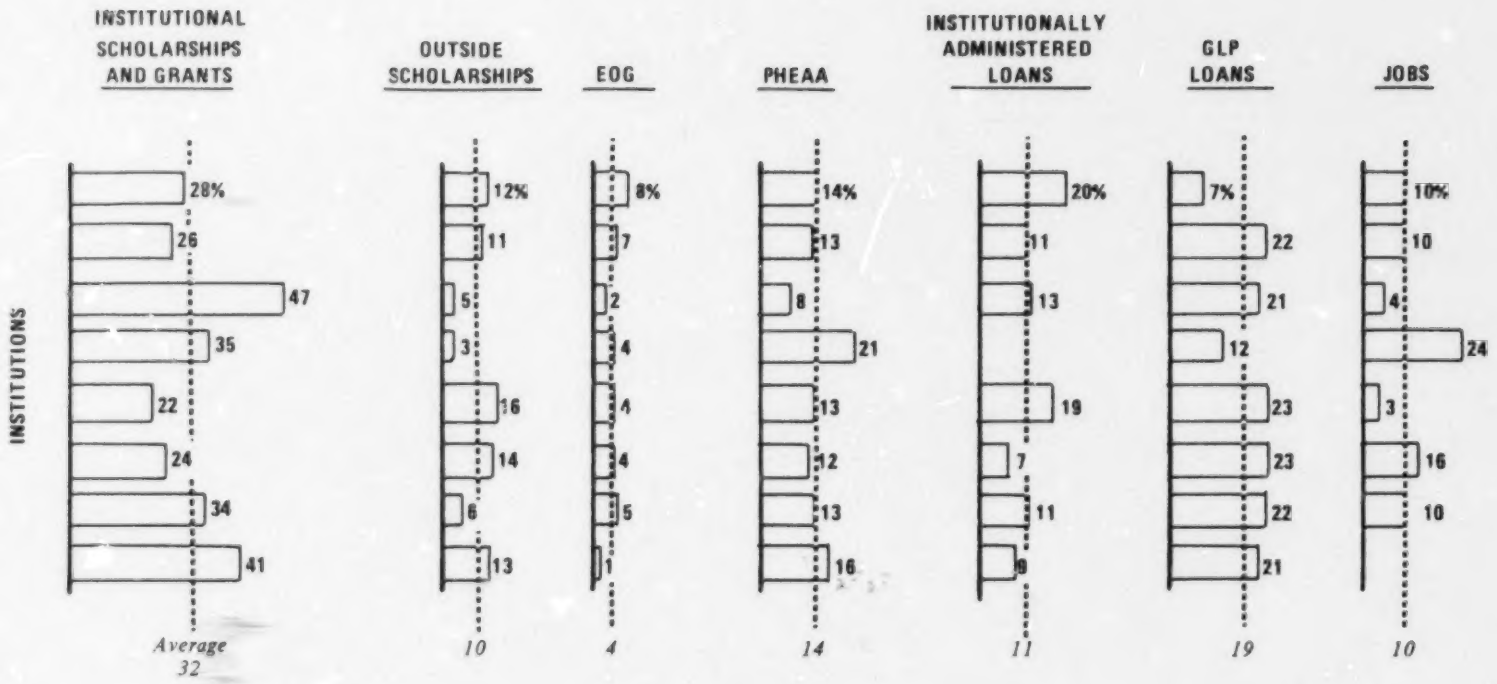

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Exhibit III

LIST OF QUESTIONS

TO GUIDE INDIVIDUAL INSTITUTIONS IN

INVESTIGATING COST-REDUCTION OPPORTUNITIES

A - ACADEMIC PROGRAMS

1. How can we account for the variations between our institution and others in resources expended per registration?

    a. Among similar divisions?

    b. Among similar departments within divisions?

2. Are the "high cost" areas at our institution a result of:

    a. Conscious policy decisions?

    b. Low quality of teaching (and thus low registrations)?

    c. An accumulation of past decisions?

    d. Happenstance (i.e., they just grew)?

3. To what extent are the variations inherent in the nature of the disciplines of divisions and departments?

    a. Except for differences inherent in the nature of the disciplines, do students enrolled in various disciplines receive "equitable" shares of the institution's resources?

    b. To what extent do (can) inherently high cost disciplines (hard sciences) carry a higher price tag (e.g., through lab fees) - i.e., can the student be asked to pay according to resources consumed?

4. How can our institution go about improving resource utilization in academic divisions and departments without compromising educational objectives?

    a. Is the current distribution of resources consciously and rationally related to generally understood objectives?

b. If so, what are those objectives?

c. In the absence of such objectives, how are resources allocated?

5. What are the high leverage areas for improving resource utilization at our institution?

a. Can the requirements for numbers of faculty be reduced?

(1) By restructuring faculty work loads?

(a) Through increased emphasis on teaching

(b) By tailoring faculty assignments to recognized strengths

(c) By modifying class-size or structure

(d) By recognizing that some fields are expanding less rapidly than others?

(2) By reducing number of courses offered?

(a) Because better prepared entering students have already covered them

(b) Where, for whatever reason, demand has virtually disappeared

(c) Where there is substantial overlap in coverage

(d) Where we have simply added courses to keep abreast of growing knowledge rather than redesign curricula?

(3) By altering modes of instruction?

(a) Are instructional formats tailored to defined educational objectives?

(b) Can greater use be made of team teaching?

(c) Has the use of automated teaching methods been fully explored? without prejudice?

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(4) By reducing laboratory requirements for faculty?

(a) Reducing number of courses requiring lab-laboratories?

(b) Using "paraprofessionals" in laboratories?

(5) By placing greater share of educational burden on the student?

(6) By examining tenure structure by division and department to ascertain where tenure is a real constraint to more effective faculty utilization?

b. With requirements for members of faculty reassessed, can the cost of faculty be reduced?

(1) Does our institution face a steady drift toward high rank (and tenure) structure?

(2) Are our promotion (and retention) policies in early career stages selective, or does the first contract extension really amount to tenure?

(3) Do promotion policies virtually assure promotion once tenure is granted?

(4) By what means can senior faculty be leveraged to take advantage of their greater experience and higher cost?

c. Are our faculty compensation policies linked to an acceptable means of performance measurement?

(1) Is evaluation of faculty performance consciously and systematically related to the institution's educational objectives?

(2) Should salary scales reflect different faculty roles?

(3) Realistically, are compensation increases virtually automatic for rank and time in rank?

d. Are faculty support costs (secretarial, etc.) commensurate with benefits gained and consistent with the institution's current financial strength?

B - LIBRARY

1. Is our policy on library acquisitions based on a clearly stated rationale for the library on our campus? Is the library

   a. A collection of all important books and periodicals?

   b. A collection of those books and periodicals required to support our educational programs and objectives?

2. Have we established an effective priority system for purchasing?

3. Do we automatically purchase new publications in certain fields without regard to extent of use?

4. Do we know the proportions of library "demand" that stem from:

   a. Reading requirements specified by faculty?

   b. Voluntary reading interests of students?

   c. Faculty research requirements?

5. Given our current library policies, does comparison with other institutions suggest that library expenditures can be reduced?

   a. By lowering acquisition costs, i.e., purchasing fewer:

      (1) Titles

      (2) Copies per title

      (3) Periodicals

   b. By lowering operating costs, e.g.,

      (1) Circulation and reference personnel

      (2) Technical personnel

(3) Care and maintenance of books

(4) Storage of periodicals

c. Can we

(1) Make fuller use of students as library personnel?

(2) Collaborate with other libraries?

C - STUDENT AID

1. How can I account for the variations in student aid expenditures between our institution and others?

2. Does our institution have stated policies that guide student aid decisions?

3. To what extent do these policies reflect:

a. Educational objectives?

(1) Attracting high-quality students

(2) Maintaining geographical distribution

(3) Achieving educationally desirable socio-economic mix in student body

b. Social objectives?

(1) Aiding economically disadvantaged*

(2) Aiding minority groups*

4. Are our current student aid policies effective? Have stated objectives of student aid been met?

5. Are current policies with respect to educational and social objectives of student aid viable for the foreseeable future? Are the benefits commensurate with the costs, given competing demand for resources?

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* - Beyond the extent required by educational objectives.

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6. Do existing policies provide adequate guidelines for determining the student aid mix?

    a. Overall, for the institution?

    b. Case by case?

7. Does our current student aid mix (institutional scholarships and loans, outside scholarships and loans, student or parental contribution, jobs) make optimal use of resources?

    a. Are "outside" sources fully exploited?

    b. Do we require enough student participation in the financing of their education?

    c. Do we "over-aid" some students?

    d. Why is such a low percentage of total aid accounted for by campus work?

8. 8. Can we take fuller advantage of the Pennsylvania Higher Education Assistance Agency (PHEAA) by recruiting economically disadvantaged students (including minority groups) from Pennsylvania in greater numbers?

9. Can we better coordinate the award of outside aid (e. g., the Guaranteed Loan Program) with our own awards?

10. Can we increase participation in state and federal guaranteed commercial loans?

D - ADMINISTRATIVE COSTS

1. Which administrative functions appear to be more expensive for us than for other institutions?

    a. President's office?

    b. Chief academic officer's office?

    c. Business functions?

    d. Registrar?

2. How can I account for these differences?

3. To what extent are differences due to size or location of our institution?

4. Are there policy considerations (with respect to the learning and living environment) that cause some of the differences?

    a. If so, when have those policies been reexamined?

    b. If not, can we set targets (10%, 20%, etc.) for administrative cost reduction?

        (1) Which functions can be eliminated?

        (2) Which functions can be performed with fewer people?

    c. Can we benefit from more cooperative arrangements with other institutions, for example, in

        (1) Placement?

        (2) Purchasing?

        (3) Administrative data processing?

        (4) Insurance?

E - STUDENT SERVICES

1. Health care

    a. Is our policy with respect to health care explicitly related to institutional objectives (or implicit in some form in the notion of in loco parentis)?

    b. How does our range of health care services compare with that of other institutions?

        (1) Physicians

        (2) Psychiatrists or psychologists

(3) Nurses

(4) Infirmary

c. Does our location or housing arrangement dictate higher than "average" health care costs?

d. Given the range of care provided, do our costs seem out of line with those of other institutions?

(1) If so, what accounts for the differences?

(2) Are there cost-reduction opportunities?

e. Can health care costs be controlled through the use of part-time personnel, cooperative arrangements, contracts with local hospitals?

f. Should students pay for health services

(1) As part of tuition?

(2) Through standard fee?

(3) According to use?

(4) Through adequate compulsory insurance?

2. Student counseling (Dean of Students' Office)

a. Is the range of counseling services we offer about the same as that for comparable institutions?

b. If there are differences, do they result from basic differences in institutional policies or needs?

c. Are our policies with respect to counseling services consistent with our current financial condition?

d. Given our policies, are there savings that can be realized within the constraints of economies of scale?

F - CASH MANAGEMENT

Can we take steps to increase investment income through tighter cash management?

a. By decreasing cash in demand accounts, through

   (1) Periodic and systematic review of bank balances against computed "fair" balances?

   (2) Restricting the number of accounts (and thus balances)?

   (3) Limiting account activity?

b. By increasing available cash through internal cash management improvements, such as

   (1) Analyzing collection, deposit, and disbursement practices?

   (2) Special planning of large cash flows (e. g., tuition collection)?

c. By investing increased free balances in income-producing instruments?